Porter and Kallman then turned their attention to the particle that Porter and Thompson had observed in tumor cells and which by then had been reported by two other electron microscope laboratories (Cannan & Berger, 1951; Oberling et al., 1950). Porter and Thompson had found these particles to be limited to tumor cells and now Porter and Kallman suggested a reason: "We were . . . comparing rapidly proliferating tumor cells with 'resting' normal cells" (p. 887). They reported finding such particles in actively growing cells derived from young rat heart embryonic tissue. Because they appeared when cells, normal or tumor, were rapidly growing, they proposed "to associate these granules with growth processes in the cell, *i.e.*, in the production of new protoplasm, and they have been tentatively referred to as growth granules" (p. 887). Relying on results from absorption studies with ultraviolet microscopy (Ludford, Smiles, & Welch, 1948), which indicated a nucleotide composition of the particles, they concluded that the particles "may have a high content of ribo-nucleotides, which might be expected if they are accepted as multiplying components of the cytoplasm" (pp. 888–9). They went on to associate the particles with the microsomal fraction from fractionation studies. In what they admitted to be speculation, they continued,

> it is attractive to think of them as centers of synthesis of all cytoplasmic components. There is some preliminary evidence from the micrographs that mitochondria may begin their development in this form, but elements of the endoplasmic reticulum, the lipid granules, and inclusions, the distinctive features of differentiated cells, may be similarly derived. If such is the case, we are led to postulate that there are several subspecies among this class of cytoplasmic particles and that the complement of these in any cell would determine the type of differentiation to some extent. (p. 890)

Through the 1940s Porter's description of a lace-like reticulum and his suggestions of its function failed to attract much response from other investigators. This was largely because the structure appeared only in micrographs of whole, cultured cells, which he nearly alone was making. This changed with the improvement in techniques for making micrographs of ordinary thin-sliced cells. Albert Dalton (1951a; Dalton et al., 1950) published electron micrographs which showed a number of filamentous units in the cytoplasm, which tended to be grouped in particular areas and which were reduced in number when the animal fasted.[26] Soon thereafter, Wilhelm Bernhard and

[26] "Differentiation of filament-like stands are present in the cytoplasm of the proximal tubule cells but they have been found only in the basal parts of the cells and are somewhat thinner (approximately 0.05μ) than cell membranes. They are also identifiable by the fact that they terminate in the cytoplasm without returning to one of the tubule surfaces. . . . These structures